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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/841,492	04/24/2001	John Michael Karanikas	5659-08000/EBM	4052

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EXAMINER

KRECK, JOHN J

ART UNIT	PAPER NUMBER
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3673

DATE MAILED: 09/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/841,492

Applicant(s)

KARANIKAS ET AL.

Examiner

John Kreck

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4904-4955 is/are pending in the application.
- 4a) Of the above claim(s) 4928-4955 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 4904-4927 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 01 March 2002 is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

The Art Unit location of your application in the USPTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Art Unit 3673.

An interview was conducted with Eric Meyertons on 8/19/02 for a related application. During this interview, it was determined that applicant's definition of hydrocarbons was meant to include fossil fuels; which may also include oxygen, nitrogen, or sulfur in their molecular structures; but not to include minerals such as trona. Although this definition is somewhat broader than the generally accepted chemist's definition; it generally corresponds to the definition in the petroleum industry. It was also agreed that "at least about 7" heat sources per production well is meant to give some flexibility where large numbers of production wells are used, and the "about" was not meant to apply to the case of a single production well. It was also determined that applicants' definition of "non-condensable hydrocarbon" also applies to "non-condensable component".

The amendments dated 10/01/01 and 3/1/02 have been entered.

Claims 4904-4955 are pending in this application.

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

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- I. Claims 4904-4927, drawn to a method of sequestering carbon dioxide, classified in class 588, subclass 250.
- II. Claims 4928-4955, drawn to a method of in situ sequestration of carbon dioxide and pyrolyzation of formation hydrocarbons, classified in class 166, subclass 272.1.

The inventions are distinct, each from the other because of the following reasons:

Inventions II and I are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because it does not include the allowing the formation to cool and increasing the permeability. The subcombination has separate utility such as sequestering carbon dioxide in a coal formation after methane production, but without pyrolyzation.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Eric Meyertons on 9/20/02 a provisional election was made with traverse to prosecute the invention of group I, claims 4904-4927. Affirmation of this election must be made by applicant in replying to this Office

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action. Claims 4928-4955 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Drawings

2. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 3/1/02 have been approved. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

Specification

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

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Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 4904-4927 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over copending applications (including the present application): 09/840,936; 09/840,937; 09/841,000; 09/841,060; 09/841,061; 09/841,127; 09/841,128; 09/841,129; 09/841,130; 09/841,131; 09/841,170; 09/841,193; 09/841,194; 09/841,195; 09/841,238; 09/841,239; 09/841,240; 09/841,283; 09/841,284; 09/841,285; 09/841,286; 09/841,287; 09/841,288; 09/841,289; 09/841,290; 09/841,291; 09/841,292; 09/841,293; 09/841,294; 09/841,295; 09/841,296; 09/841,297; 09/841,298; 09/841,299; 09/841,300; 09/841,301; 09/841,302; 09/841,303; 09/841,304; 09/841,305; 09/841,306; 09/841,307; 09/841,308; 09/841,309; 09/841,310; 09/841,311; 09/841,312; 09/841,429; 09/841,430; 09/841,431; 09/841,432; 09/841,433; 09/841,434; 09/841,435; 09/841,436; 09/841,437; 09/841,438; 09/841,439; 09/841,440; 09/841,441; 09/841,442; 09/841,443; 09/841,444; 09/841,445; 09/841,446; 09/841,447; 09/841,448; 09/841,449; 09/841,488; 09/841,489; 09/841,490; 09/841,491; 09/841,492; 09/841,493; 09/841,494; 09/841,495; 09/841,496; 09/841,497; 09/841,498; 09/841,499; 09/841,500; 09/841,501; 09/841,502; 09/841,632; 09/841,633; 09/841,634; 09/841,635; 09/841,636; 09/841,637; 09/841,638; and 09/841,639.

Although the conflicting claims are not identical, they are not patentably distinct from other. At least one other application includes a set of claims which are substantially identical to the claims in this application; but which call for coal containing formation rather than hydrocarbon. Since applicant has defined hydrocarbon containing formation as including coal; this would be an obvious variation.

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37 CFR 1.78(b) provides that when two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application. The discussion below sets forth the Office's basis for its determination that each of these ninety one applications contains at least one claim that conflicts with another one of the related co-pending applications identified above. Each of these ninety one applications includes the same specification and collectively these ninety one applications present over five thousand claims. The Office has shown that each of these ninety one applications contains at least one claim that conflicts with another one of the related co-pending applications identified above, and an analysis of each of five thousand claims in the ninety one related co-pending applications would be an extreme burden on the Office requiring tens of thousands of claim comparisons. Therefore, the Office is requiring applicant to resolve the conflict between these applications and comply with 37 CFR 1.78(b) by either:

(1) filing a terminal disclaimer in each of the related ninety-one applications terminally disclaiming each of the other ninety applications; or,

(2) provide a statement that all claims in the ninety applications have been reviewed by applicant and that no conflicting claims exist between the applications. Such a statement must set forth factual information to identify how

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all the claims in the instant application are distinct and separate inventions from all the claims in the above identified ninety applications.

See MPEP 804.02 IV for a discussion of multiple double patenting rejections and the requirements for a single terminal disclaimer.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 4907, 4918, and 4918 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4907 is unclear whether the carbon dioxide is the carbon dioxide that has been stored, or carbon dioxide present in the formation before sequestering.

Claim 4917 is unclear regarding the using the carbon dioxide prior to storing the carbon dioxide. Since the step of using the carbon dioxide inherently stores the carbon dioxide, it is unclear how it can be "before".

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Claim 4918 is unclear regarding the using the carbon dioxide prior to storing the carbon dioxide. Since the step of using the carbon dioxide inherently stores the carbon dioxide, it is unclear how it can be "before".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 4904-4926 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terry (U.S. Patent number 4,089,374) in view of Chaback, et al. (U.S. Patent number 5,454,666).

The Chaback reference teaches a method of sequestering carbon dioxide within a hydrocarbon (coal) formation which has been previously depleted of methane. Chaback fails to teach the heating and allowing to cool.

The Terry reference teaches a method of producing methane from a coal seam including heating to increase permeability and allowing the formation to cool. The Terry reference teaches that the disclosed method results in increased methane production.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the Chabak method to have the methane produced by

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heating to increase permeability and cooling the formation as taught by Terry, and as called for in claim 4904, in order to increase methane production.

With regards to claim 4905, the Terry reference does not explicitly disclose the 100 millidarcy; however this is inherent with a shrinking coal as taught by Terry.

With regards to claim 4906, the Chaback reference does not explicitly disclose the raising the water level; however this is inherent because the water table would naturally return to normal levels.

With regards to claim 4907, the Terry reference teaches the heating to release carbon dioxide (this is inherent when burning coal with an oxidizer see col. 2, last paragraph), thus it would have been further obvious to one of ordinary skill in the art at the time of the invention to have heated the formation to release carbon dioxide, in order to increase methane production.

With regards to claim 4908, the Terry reference teaches the pyrolyzing (this is inherent when heating coal at the disclosed temperatures), thus it would have been further obvious to one of ordinary skill in the art at the time of the invention to have included pyrolyzing, in order to increase methane production.

With regards to claim 4909, the Terry reference teaches the synthesis gas (col. 3, line 2), thus it would have been further obvious to one of ordinary skill in the art at the time of the invention to have included producing synthesis gas, in order to increase methane production.

With regards to claim 4910, the Terry reference teaches heating and introducing oxidizing fluid, thus it would have been further obvious to one of ordinary skill in the art

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at the time of the invention to have included heating and introducing oxidizing fluid, in order to increase methane production.

Regarding claim 4911; applicant has not disclosed that electrical heating provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well without heating because the nature of the heating mechanism does not impart any special qualities on the heat produced. Therefore, it would have been obvious to one of ordinary skill in the art to further modify the Chaback to obtain the invention as specified in claim 4911.

With regards to claim 4912, the Terry reference teaches temperatures between 200°C and 1200°C, thus it would have been further obvious to one of ordinary skill in the art at the time of the invention to have included temperatures between 200°C and 1200°C, in order to increase methane production.

With regards to claim 4913, the Terry reference teaches circulating fluid, thus it would have been further obvious to one of ordinary skill in the art at the time of the invention to have included circulating fluid, in order to increase methane production.

With regards to claim 4914, the Terry reference teaches the burner, thus it would have been further obvious to one of ordinary skill in the art at the time of the invention to have included a burner, in order to increase methane production.

With regards to claim 4915, the Terry reference teaches steam, thus it would have been further obvious to one of ordinary skill in the art at the time of the invention to have included steam, in order to increase methane production.

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With regards to claim 4916, the Terry reference teaches removing fluid and combusting, thus it would have been further obvious to one of ordinary skill in the art at the time of the invention to have included removing fluid and combusting, in order to increase methane production.

Regarding claim 4917, Chaback teaches the using CO₂ for demethanation.

With regards to claim 4918, the use of carbon dioxide for enhanced oil recovery is well known, and it would have been further obvious to one of ordinary skill in the art at the time of the invention to have used some carbon dioxide for enhanced oil recovery.

With regards to claim 4919; Applicant has not disclosed that the source for the carbon dioxide provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with carbon dioxide from combustion because carbon dioxide is fungible. Therefore, it would have been obvious to one of ordinary skill in the art to further modify the Chaback method to obtain the invention as specified in claim 4919

Regarding claim 4920, Chaback teaches the combustion product (flue gas col. 3, line 17).

With regards to claim 4921, the Terry reference teaches allowing to cool by introducing water and removing steam, thus it would have been further obvious to one of ordinary skill in the art at the time of the invention to have included allowing to cool by introducing water and removing steam, in order to increase methane production.

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With regards to claim 4922, the Terry reference teaches using steam as heat transfer fluid, thus it would have been further obvious to one of ordinary skill in the art at the time of the invention to have included using steam as heat transfer fluid, in order to increase methane production.

Regarding claim 4923, Chaback teaches the adsorbing carbon dioxide.

Regarding claim 4924, Chaback teaches passing a first fluid stream, adsorbing carbon dioxide, and removing a second fluid stream.

Regarding claim 4925, Chaback teaches approximately 789 SCF per ton adsorbed (col. 8, line 12), which would be considerably more than generated by heating.

With regards to claim 4926; the Chaback and Terry references fail to explicitly disclose the number of wells and the pattern; however Terry discloses "various wells". Since this includes at least 3 wells this inherently includes a triangle. It would have been further obvious to one of ordinary skill in the art at the time of the invention to have further modified the Chaback method to have included at least 3 wells in a triangle as called for in claim 4926, in order to increase production.

6. Claim 4927 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chaback and Terry, at al. as applied to claim 4904 above, and further in view of Salomonsson (U.S. Patent number 2,914,309).

The Chaback and Terry references fail to explicitly teach the unit of wells in a triangular pattern and the plurality of units in a repetitive pattern.

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Salomonsson teaches that it is desirable to have a repetitive pattern in order to cover the area evenly. It is apparent that this is beneficial in order to prevent hot spots.

It would have been further obvious to one of ordinary skill in the art at the time of the invention to have further modified the Chaback method to have included a unit of a triangular pattern and a repetitive pattern of units as called for in claim 4927; in order to cover the area evenly.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Cohn, et al. (U.S. Patent number 5,491,969); Gunter, et al. (U.S. Patent number 6,412,559); and Viteri, et al. (U.S. Patent number 6,389,814) teach CO₂ sequestration. Chaback, et al. (U.S. Patent number 5,566,756); Mones (U.S. Patent number 6,244,338); Puri, et al. (U.S. Patent number 5,014,788); and Wilson (U.S. Patent number 5,402,847) teach methane production from a coal seam with increased permeability..

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Kreck whose telephone number is (703)308-2725. The examiner can normally be reached on M-F 6:00 am - 3:00 pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Heather Shackelford can be reached on (703)308-2978. The fax phone numbers for the organization where this application or proceeding is assigned are

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(703)305-3597 for regular communications and (703)305-7687 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)306-4177.

JJK
September 20, 2002


DAVID BAGNELL
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